The analysis found that 430 dwelling units, one school, and five churches would be exposed to noise levels exceeding the 66 dBA criterion under future no build conditions compared to 466 dwelling units, one school, and five churches with the proposed project. Future traffic would be closer to residences with the wider roadway in the depressed section of I-75, but with the new lane constructed into the embankment, it will tend to be shielded from sensitive receptors. In the northern, at-grade and elevated sections, the lane will be added in the median, so the center-of-road noise will actually move slightly away from receptors. And, the proposed concrete median safety barrier would provide some limited benefit.

4.8.4 Noise Mitigation Considerations

The test of whether noise mitigation should be pursued rests on whether such mitigation is "feasible" and "reasonable." The "feasible" test relates to whether mitigation is physically or institutionally possible and can achieve the desired reduction in noise levels of at least five decibels. Feasible solutions can generally be achieved, but not always. For example, with noise walls, there are engineering limitations on height, especially on bridges. In other cases, there may be a noise source that cannot be controlled with a noise wall. Also, noise wall construction must adhere to safety design criteria, especially stopping sight distance, i.e., walls must be clear of intersections and be positioned in ramp merge areas so that motorists have a clear field of view.

The "reasonable" test addresses whether noise mitigation is cost-effective. This involves examination of how many sensitive receptors can benefit per dollar invested. The current inflation-adjusted value per benefiting dwelling unit is $34,200 (2003 dollars). This applies to those units that would experience at least a 5-decibel reduction in the loudest hour. The current costs to construct a noise wall are $23.77 per square foot, plus $219.60 per linear foot for wall foundation, drainage, and other considerations.

Noise mitigation falls into two general categories. "Type I" projects involve new roadway construction of a type that increases roadway capacity, i.e., in other words, projects that could serve greater traffic volumes and hence generate more traffic noise. These are eligible for federal funding through FHWA as a normal part of project construction. "Type II" projects may be described as retrofits, independent noise mitigation not related to any roadway capacity increase.

With the build alternatives, noise mitigation will be included as a normal part of the I-75 project's federal funding (subject to local review and approval of property owners). With the No Build Alternative any mitigation would be considered Type II. While MDOT does undertake Type II projects, funding is limited:[1]

> "MDOT will construct Type II sound walls only in years when MDOT's Road and Bridge Program, excluding maintenance, exceeds $1.0 billion, adjusted to the Consumer Price Index (CPI) using 2002 as the base year. MDOT will not spend more than one half of one percent of the budget on sound walls. MDOT will give priority to those communities where the freeway was constructed through an existing neighborhood and where 80 percent or more of the existing residential units were there prior to the construction of the freeway. Communities must make application to MDOT and provide a local match of 10 percent of the cost of the sound wall."

[1] *Noise Abatement*, Michigan State Transportation Commission Policy, July 31, 2003.

It is evident from this policy that, under no-build conditions, only the southern section of the corridor would be eligible for walls. Communities to the north allowed residential development to occur in areas too close to the freeway, after the freeway was built in the 1960s.

A number of potential mitigation measures may be considered to reduce noises levels. These include lowering the roadway profile, restricting or prohibiting truck traffic, reducing traffic speeds, insulating public use or nonprofit institutional structures, and constructing noise berms or barriers. Some lowering of the roadway will occur in the depressed section of I-75 to gain more clearance under bridges. But, connections to the numerous ramps and the grades and tapers associated with these ramps limit the ability to lower the freeway. For these reasons, lowering the roadway profile is not considered feasible or reasonable.

Restricting or prohibiting truck traffic is not feasible because I-75 is an interstate highway. It is specifically designed to accommodate commercial traffic. Similarly, lowering the speed limits for noise reduction is counter to the purpose of moving people and goods in an efficient manner over the state highway system. MDOT is committed to maintaining speed limits that allow safe and efficient travel, which means maintaining a 55 mph minimum speed limit, and increasing it, where possible, up to the state limit of 70 mph.

Noise barriers consist of earthen berms or walls, or combinations of the two. Berms are cost-effective and can substantially reduce noise levels. However, they take up a lot of space. In the I-75 corridor such space is limited due to needs for drainage and the proposed lane addition. Construction of berms would require property acquisition, meaning additional relocations and wetland impacts, and local tax base loss. So, berms were not considered reasonable. This leaves noise walls as the preferred mitigation. Under special circumstances insulating public use or nonprofit institutional structures will be considered.

4.8.5 Noise Barrier Analysis

Noise mitigation was examined for all residential areas along the corridor, where traffic-generated noise was expected to be 66 dBA or greater, except where development densities are very low. In the depressed section of I-75 south of 12 Mile Road, noise walls were modeled for placement between the mainline lanes and the service drives, or between ramps and service drives. In this position, they are effective in breaking the line-of-site between homes and mainline I-75 traffic. Where ramps are present, mainline and ramp walls were overlapped in the modeling to prevent gaps. The walls in this analysis were positioned with sight distance and clear-view angle distances taken into account in ramp areas and at intersections. So, walls must end some distance away from intersections. Often commercial uses are at these intersections. So, ending walls in these areas generally does not limit the protection afforded to residential locations.

Noise walls could be positioned between the service drive and adjacent homes. However, as the service drives are local streets (not MDOT-maintained roads), any positioning of such walls would require an agreement with the local government to take over ownership of the walls. Based on an agreement signed at the time of construction, MDOT would maintain the structural integrity of the wall for five years, and then the local jurisdiction would accept ownership and maintenance of the wall.

Because service drives provide direct access to homes, and/or connect to the many cross streets on which these homes front, positioning walls between the service drives and homes would cut access to the homes or streets. Closing connecting streets is not practical. Typically, cul-de-sacs

must be provided for emergency vehicle turnarounds. These cul-de-sacs require right-of-way, which often means taking residential property, including homes. For this reason walls have not been positioned outside the service drives in the southern-most part of the corridor. Nevertheless, this option does remain, if the local community wishes to pursue it and is willing to take over ownership.

In sections of the corridor where I-75 is not in a depressed section, i.e., from 12 Mile Road to the north, walls would be positioned behind guards rails where possible, and at the right-of-way edge otherwise. When a road is at-grade or elevated, noise walls are usually most effective at the roadway edge, rather than the right-of-way edge. A final consideration is that typically walls are to be a minimum of 590 feet long. It is noted that safety, maintenance, and drainage issues encountered during roadway design could change the assumptions used in the analysis of noise for this DEIS.

Barriers that were found reasonable and feasible are listed in bold in Table 4-14 and are shown on Figure 4-5. One wall would protect a church and another would protect a school. (For purposes of analysis, these institutions are counted as the equivalent of 10 dwelling units in the cost formula.) The existing noise wall in the northeast quadrant of the I-696 interchange will be impacted by the proposed ramp braiding. It would be replaced with a new wall. A discussion of the results for each analysis segment follows.

It is noted that where noise walls are not found to be reasonable, i.e., where the cost exceeds $34,200 per benefiting dwelling unit, the local community can participate in funding to bring the cost down to the $34,200 level. Therefore, other walls could become reasonable, if a local community decided to participate in funding.

The TNM2.1 model was run for 12 segments.

- Segment 1 - 8-Mile Road to Meyers Avenue
- Segment 2 - Meyers Avenue to 9 Mile Road
- Segment 3 - 9 Mile Road to Woodward Heights Boulevard
- Segment 4 - Woodward Heights Boulevard to I-696
- Segment 5 - I-696 to Gardenia Avenue
- Segment 6 - Gardenia Avenue to north of 12 Mile Road
- Segment 7 - North of 12 Mile Road to 14 Mile Road
- Segment 8 - 14 Mile Road to Rochester Road
- Segment 9 - Rochester Road to Livernois Road
- Segment 10 - Livernois Road to Wattles Road
- Segment 11 - Wattles Road to Coolidge Highway
- Segment 12 - Coolidge Highway to North Project Limit

Segment 1 – 8 Mile Road to Meyers Avenue

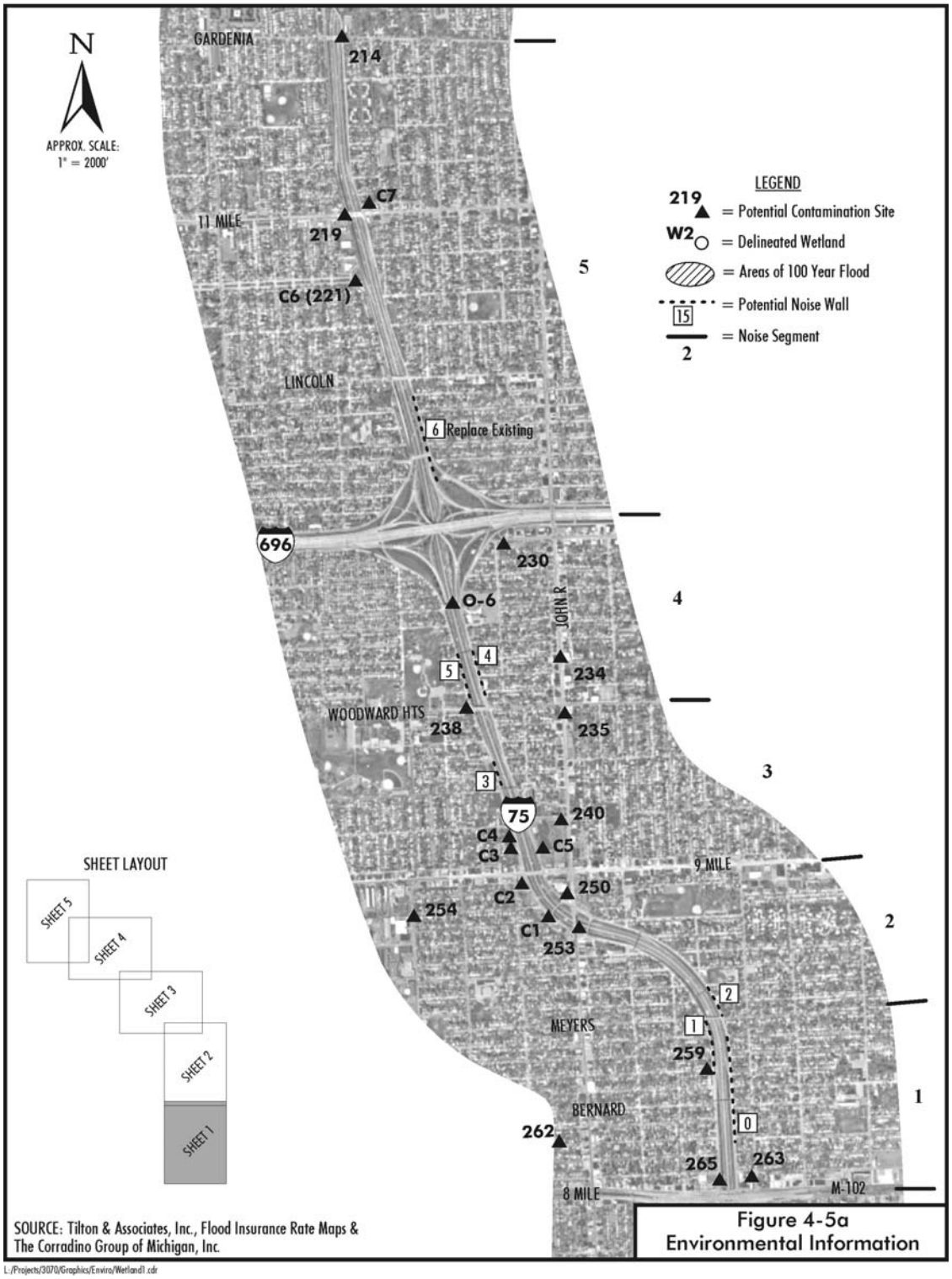
Three noise walls were considered in this segment. Northbound, a wall was modeled between the lanes of I-75 and its service drive beginning at Hayes Avenue and extending north beyond Madge Avenue (this wall is called NB 1). The safety setback requirements were observed in setting the endpoints of the walls in the vicinity of the on-ramp near Hayes Avenue and Meyers Avenue.

Walls were modeled on the southbound (west) side of I-75 to protect residences on that side of the road from I-75 noise (SB 1 and SB 2). Two of the three walls modeled, NB 1 and SB 1, were

Table 4-14
Noise Barrier Analysis
(See Figures 4-5a to 4-5e)

	Location/Designation	Length (Feet)	Average Height	Cost	Benefiting Receivers	Cost per Ben. Rec.
Feasible and Reasonable Walls	8 Mile to Meyers Avenue					
	Wall 0 – NB 1	**2117**	**10.5**	**$994,630**	**31**	**$32,085**
	Wall 1 - SB 1	**1,002**	**7.5**	**$397,831**	**12**	**$33,153**
	Meyers Avenue to 9 Mile Road					
	Wall 2 - NB 1	**644**	**10.0**	**$294,440**	**10**	**$29,444**
	9 Mile to Woodward Heights Blvd.					
	Wall 3 - SB 1	**594**	**8.0**	**$243,598**	**8**	**$30,450**
	Woodward Heights Blvd. To I-696					
	Wall 4 - NB - Church counts as 10 dwellings[a]	**669**	**10.0**	**$306,052**	**10**	**$30,605**
	Wall 5 - SB 2 -School counts as 10 dwellings[a]	**656**	**10.0**	**$300,119**	**10**	**$30,012**
	I-696 to Gardenia Avenue					
	Wall 6 - Replacement Wall	**1,368**	**10.0**	**$625,587**	**NA**[b]	**NA**[b]
	Gardenia to North of 12 Mile Road					
	Wall 7 - SB1	**598**	**13.0**	**$316,898**	**14**	**$22,636**
	North of 12 Mile Road to 14 Mile Road					
	Wall 8 - NB 1	**658**	**12.0**	**$332,325**	**12**	**$27,694**
	Wall 9 - NB 2	**3,310**	**12.7**	**$1,723,718**	**92**	**$18,736**
	14 Mile Road to Rochester Road					
	Wall 10 - SB 1	**1,223**	**10.0**	**$559,432**	**17**	**$32,908**
	Rochester Road to Livernois Road					
	Wall 11 - NB1	**695**	**10.9**	**$332,568**	**10**	**$33,257**
	Wall 12 - NB2	**1,143**	**11.9**	**$575,489**	**17**	**$33,852**
	Wall 13 - SB1	**646**	**10.0**	**$295,208**	**24**	**$12,300**
	Wall 14 - SB2	**2,381**	**13.1**	**$1,263,340**	**83**	**$15,221**
	Livernois Road to Wattles Road					
	Wall 15 - SB 1	**2,749**	**13.5**	**$1,486,948**	**56**	**$26,553**
	Wattles Road to Coolidge Highway					
	Wall 16 - SB1 & SB2	**2,078**	**12.5**	**$1,072,462**	**35**	**$30,642**
	Totals	**22,531**		**$11,120,645**	**441**	**$25,217**
Walls Not Feasible or Reasonable	8 Mile to Meyers Avenue					
	SB 2	1,880	11.5	$927,153	5	$185,431
	Meyers Avenue to 9 Mile Road					
	NB Church - Church 10 dwellings	403	10	$184,074	6	$30,679[d]
	NB 2	600	8.8	$257,861	4	$64,465
	SB 1	1,323	7	$510,202	9	$56,689
	9 Mile to Woodward Heights Blvd.					
	NB 1	1,333	12.7	$693,555	15	$46,237
	Woodward Heights Blvd. To I-696					
	SB 1	465	16	$278,969	0	-
	Gardenia to North of 12 Mile Road					
	NB 1	447	14.6	$253,656	6	$42,276
	SB2	676	10	$308,921	0	-
	Wattles Road to Coolidge Highway					
	NB	1,596	10	$729,658	7	$104,237
	SB3	472	12	$238,524	22	$10,842[d]
	Square Lake Noise Wall Project[c]					

Source: The Corradino Group of Michigan, Inc.
[a] These walls are considered reasonable as schools and churches are counted as 10 dwelling units.
[b] This wall functionally replaces the present wall, a portion of which would be removed by the project.
[c] Noise walls were completed in 2003 in the Square Lake Road area as a separate project. See Figure 4-5e.
[d] These walls are not of sufficient length to be considered feasible.



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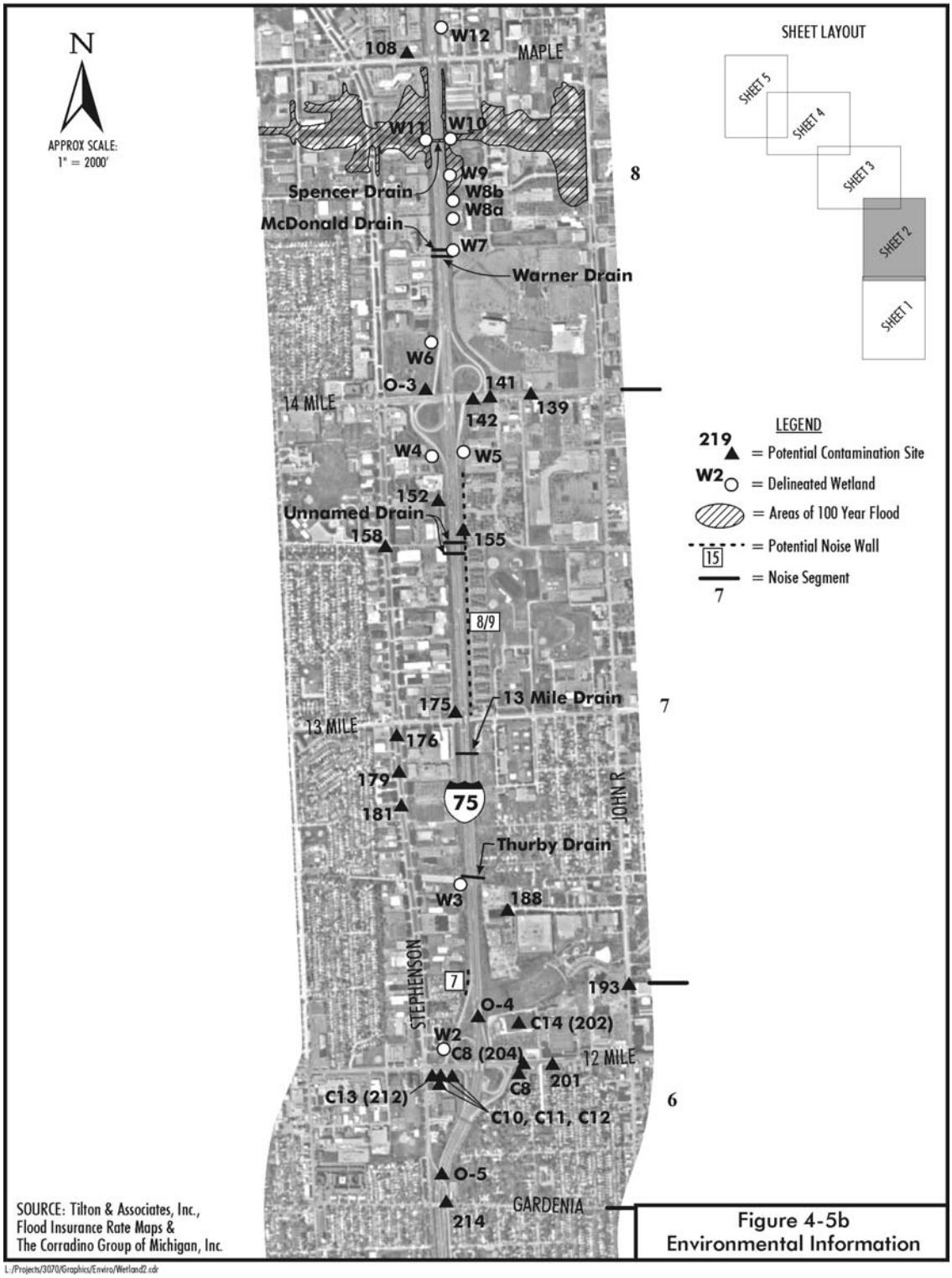
N
APPROX SCALE:
1" = 2000'
SHEET LAYOUT
SHEET 5
SHEET 4
SHEET 3
SHEET 2
SHEET 1
108
W12
MAPLE
W11
W10
W9
W8b
W8a
Spencer Drain
McDonald Drain
W7
Warner Drain
8
W6
O-3
141
139
142
14 MILE
W4
W5
152
Unnamed Drain
158
155
8/9
175
13 Mile Drain
7
13 MILE
176
179
181
75
JOHN R
Thurby Drain
W3
188
STEPHENSON
7
193
O-4
C14 (202)
W2
C8 (204)
12 MILE
C8
201
C13 (212)
C10, C11, C12
6
O-5
214
GARDENIA
LEGEND
219 = Potential Contamination Site
W2 = Delineated Wetland
= Areas of 100 Year Flood
= Potential Noise Wall
15 = Noise Segment
7
SOURCE: Tilton & Associates, Inc.,
Flood Insurance Rate Maps &
The Corradino Group of Michigan, Inc.
Figure 4-5b
Environmental Information
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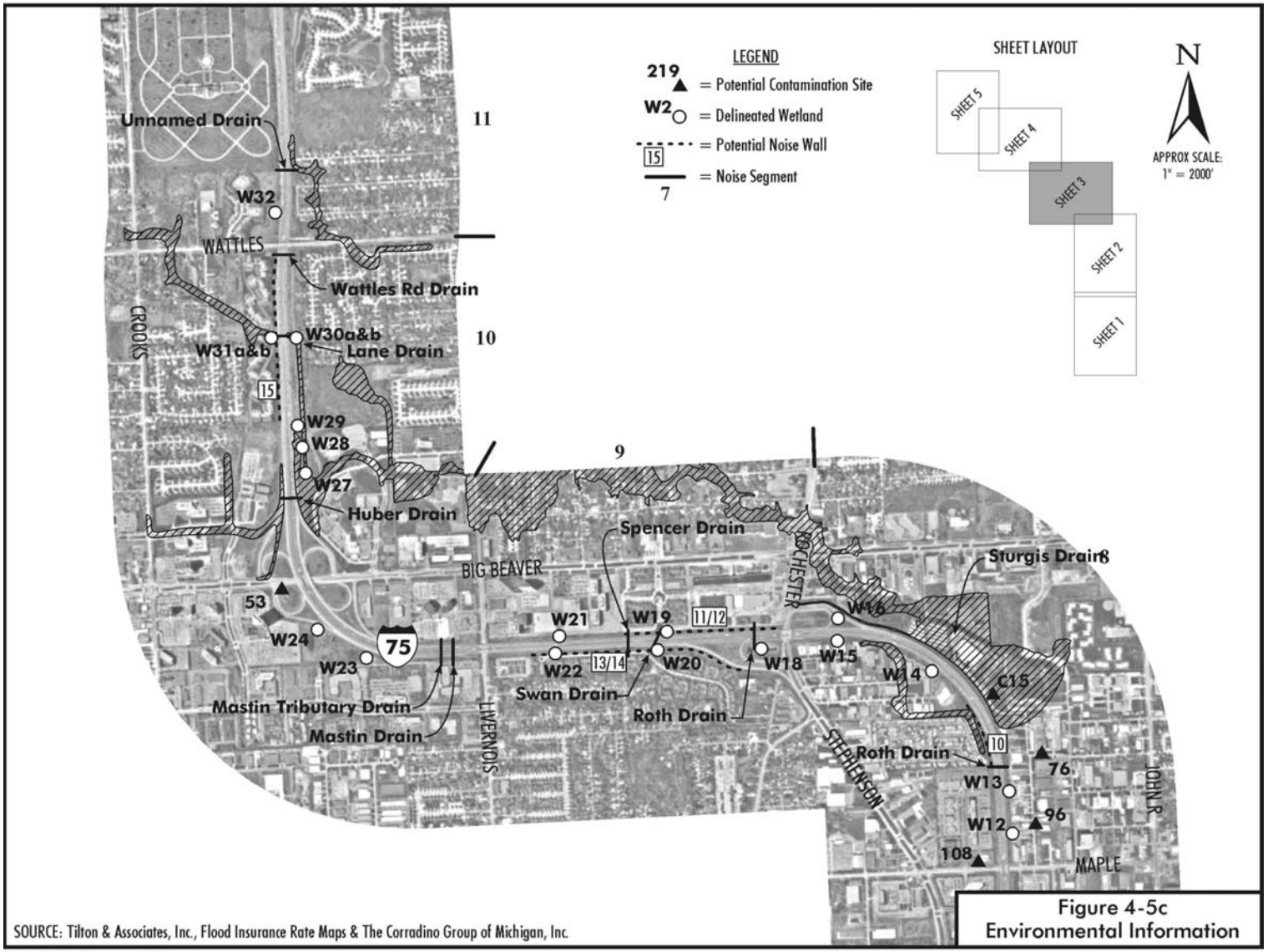

SOURCE: Tilton & Associates, Inc., Flood Insurance Rate Maps & The Corradino Group of Michigan, Inc.

Figure 4-5c
Environmental Information

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Figure 4-5d
Environmental Information
SOURCE: Tilton & Associates, Inc., Flood Insurance Rate Maps & The Corradino Group of Michigan, Inc.
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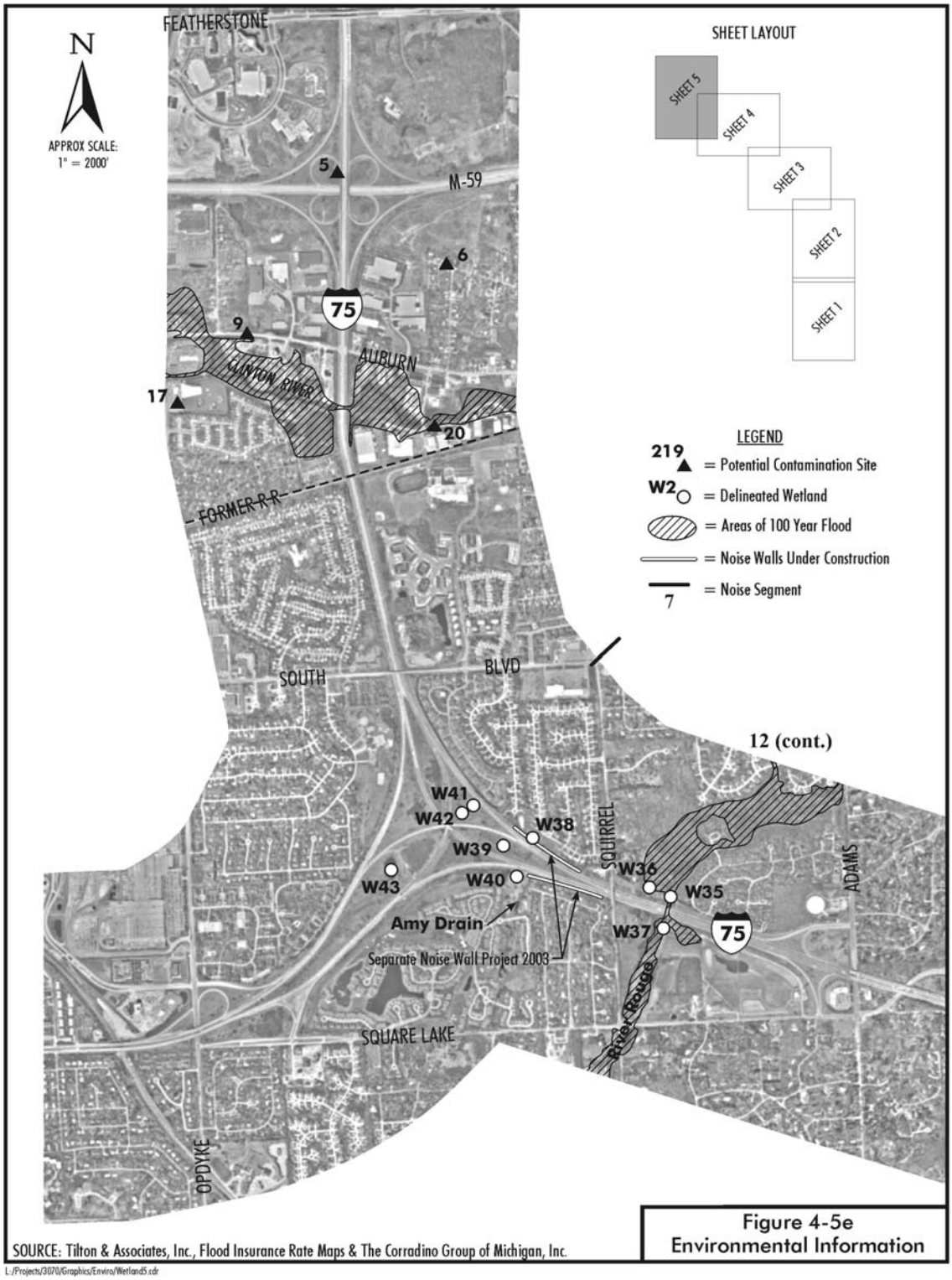
N
APPROX SCALE:
1" = 2000'
SHEET LAYOUT
SHEET 1
SHEET 2
SHEET 3
SHEET 4
SHEET 5
LEGEND
219 = Potential Contamination Site
W2 = Delineated Wetland
= Areas of 100 Year Flood
15 = Potential Noise Wall
7 = Noise Segment
11 (cont.)
12
ADAMS
COOLIDGE
CROOKS
SQUARE LAKE
SQUARE LAKE
LONG LAKE
River Rouge
W34
O-1
O-2
16
30
75


N
APPROX SCALE:
1" = 2000'
FEATHERSTONE
SHEET LAYOUT
SHEET 5
SHEET 4
SHEET 3
SHEET 2
SHEET 1
5
M-59
6
75
9
CLINTON RIVER
AUBURN
17
20
FORMER R R
LEGEND
219 = Potential Contamination Site
W2 = Delineated Wetland
= Areas of 100 Year Flood
= Noise Walls Under Construction
7 = Noise Segment
SOUTH
BLVD
12 (cont.)
W41
W42
W38
W39
W40
W43
SQUIRREL
W36
W35
ADAMS
Amy Drain
W37
75
Separate Noise Wall Project 2003
River Rouge
SQUARE LAKE
OPDYKE
SOURCE: Tilton & Associates, Inc., Flood Insurance Rate Maps & The Corradino Group of Michigan, Inc.
Figure 4-5e
Environmental Information
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considered to be reasonable, meaning the cost per benefiting receiver was less than $34,200 (see Wall 0 and Wall 1 in Figure 4-5a).

The first wall found to be feasible and reasonable in this segment extends from north of the on-ramp from 8 Mile Road to north of Madge Avenue. The proposed design calls for shifting the on-ramp to northbound I-75 to the south from it present position. This shift has the effect of reducing the length of the service drive that carries the heavy traffic volumes from 8 Mile Road to I-75. That means a wall between I-75 and the service drift is not rendered ineffectual by the service drive volumes. The dwellings along the service drive are uniformly dense. So, 31 receivers would benefit from a five decibel reduction in noise if a wall about 2,100 feet long and 10.5 feet high were built. The cost per benefiting receiver would be $32,100.

The second reasonable and feasible wall in this section, SB 1, is on the west side of I-75 between Meyers Avenue and the southbound off-ramp to the service drive three blocks to the south. Here, all lots adjacent to the service drive are occupied by single-family dwelling units, the density on successive lots away from the service drive is high, and the service drive volume is relatively low. There are an estimated 12 benefiting receivers, at a cost per benefiting receiver of $33,200. The proposed wall is approximately 1,000 feet long and is found reasonable at a height of 8 feet.

Segment 2 – Meyers Avenue to 9 Mile Road

The next segment considered was Meyers Avenue to 9 Mile Road. Three walls were tested in the northbound direction and one wall in the southbound direction. This section of I-75 curves to the west against the grain of the background grid street system. As a consequence, the residences along this section have a staggered position with respect to the travel lanes of I-75 and its parallel service drives. Commercial uses are also interspersed with the residential uses, principally at the north and south ends of the segment. There is a northbound off-ramp and southbound on-ramp in the vicinity of Highland Avenue. These ramps serve traffic destined to John R. and 9 Mile Roads or coming from those roads to I-75 south. The Free Will Baptist Church is on the northbound service drive two blocks north of Meyers Avenue, and the Tabernacle Baptist Church is on the southbound service drive

The location called NB Church was not found to be feasible and reasonable, even if the church were considered as 10 dwelling units. The noise wall would stretch only from north of Meyers Avenue, at the point at which sight distance allows, to Harry Avenue. This distance of 400 feet does not meet the minimum noise wall length specified in the Noise Policy of 590 feet.

The location called NB 1 was found to be feasible and reasonable, benefiting 10 dwelling units at a cost per unit of about $29,400. It would be approximately 640 feet in length and 10 feet in height, and stretch from East Pearl Avenue north one block to East Roberts Avenue, ending where the off-ramp from I-75 northbound meets the service drive (see Wall 3 on Figure 4-5a). I-75 through this section is closer to being at-grade than at points to the north and south where it passes under cross roads. Therefore, a wall provides better protection from this nearly at-grade portion of I-75.

The location called NB 2, extending from the exit ramp north to John R. Road, would be short and would be truncated by the U-turn channel bridge southeast of John R. Road. Traffic volumes on the service drive at this point were in the neighborhood of 500 per hour, which makes protection of the homes in this section difficult. Several of the fronting parcels are triangular and vacant in this section. Therefore, the density simply does not support a noise wall.

The only wall modeled southbound was from the point past the southbound on-ramp south to East Meyers Avenue. North of this point is the Tabernacle Baptist Church. The service drive volumes are too high to provide a feasible wall to mitigate noise at this church. Further south, a wall positioned between the service drive and mainline I-75 lanes would not protect a sufficient density of residences to be reasonable. As was the case in the northbound direction, there are several triangular lots that are vacant that have frontage to the service drive and I-75.

Segment 3 – 9 Mile Road to Woodward Heights Boulevard

Two noise walls were modeled in this segment, one on each side of I-75. On the east side (northbound) there is housing from Orchard Avenue north to Woodward Heights Boulevard. As is true further south in the corridor, the crossroads to the service drive are at a perpendicular and spaced such that only two dwellings occupy the end of each block. A wall (NB 1) was tested between the mainline lanes of I-75 and the service drive at the top of the slope. The low density resulted in a per-unit cost too high for the wall to be considered reasonable.

On the west side of I-75 (southbound) are two apartment houses and the First Baptist Church. No wall is feasible at the First Baptist Church because there is a southbound off-ramp right in front of the church. Sight distance requirements prevent a wall in this location. But, the apartments provide a sufficiency density of housing for a wall (SB 1) to be reasonable. Feasibility is aided in this segment by a service drive volume under 400 per hour. The proposed wall would be 594 feet long and 8 feet high (see Wall 3 in Figure 4-5a). The cost per benefiting receptor for eight units would be $30,450.

Segment 4 – Woodward Heights Boulevard to I-696

On the east side of I-75, north of Woodward Heights Boulevard, residential density is relatively sparse. St. Margaret's Episcopal Church and Calvary Baptist Church are located here.

Counting St. Margaret's Episcopal Church as a special case in the reasonability formula (10 dwelling units), a wall in front of the church can be justified, even though there are few homes to support the justification of this wall. This wall would be 670 feet long and 10 feet high (see Wall 4 in Figure 4-5a).

Providing a wall for the Calvary Baptist Church is not feasible. The Shelvin Avenue crossover bridge serving the I-696 interchange is in front of this church. The bridge and service drive generate noise. Meanwhile the presence of the bridge would prevent noise wall construction along a substantial portion of the church's frontage because of required sight distances on either side.

Southbound in this segment, there is insufficient density to find wall construction to be reasonable, except for the presence of the Roosevelt School. It faces the southbound service drive. A pedestrian bridge crossover occupies several of the lots on both sides of I-75, decreasing the residential density. Counting the school as 10 residences, a wall 660 feet long and 10 feet high could be considered reasonable (see Wall 5 in Figure 4-5a).

Segment 5 – I-696 to Gardenia Avenue

This segment through Madison Heights on the east and Royal Oak on the west, has noise walls today. These noise walls would remain, But some may be in a relocated position. Relocation could occur if the lane addition into the embankment through this depressed section is in jeopardy of undermining the wall.

With the proposed ramp braiding in the northeast quadrant of the I-696 interchange, the new northbound ramps from I-696 would be placed on the residential side of the existing noise wall. The northern section of the existing noise wall in this section could be left in place. A new wall could be placed along the reconstructed ramp edge. This wall would effectively replace the existing wall. It would be approximately 1,400 feet long and average 10 feet in height (see Wall 6 in Figure 4-5a).

Segment 6 – Gardenia Avenue to North of 12 Mile Road

A wall was modeled along the outside edge of the northbound exit ramp from I-75 to 12-Mile Road (NB 1). In this quadrant of the interchange there is very low-density residential development. This is especially evident in the area adjacent to I-75. The density increases as the distance away from I-75 increases. As a result of the low density, a noise wall is not considered reasonable in this area.

A wall was modeled on the west (southbound) side of I-75 from Gardenia Avenue for several hundred feet to Stephenson Highway (SB 2). There is a long two-story apartment house in this section. The wall, which was modeled at the top of the bank between the service drive and I-75, could require a break, if the storm sewer pump station located here were to remain. But, it was modeled with the assumption that the wall would be continuous. In spite of this, several factors prevent the reasonableness of a noise wall at this location: the southbound volumes from Stephenson Highway are relatively high; I-75 is in the deepest part of its cut section; and, the northbound service drive crossing I-75 at this point acts as a barrier for noise from the section of I-75 immediately to the north.

A wall was tested on the west side of I-75 just north of the 12 Mile interchange (SB 1), at the Red Run Mobile Home Park. Housing there is dense enough to support a reasonable wall about 600 feet long and an average of 13 feet in height. There would be approximately 16 benefiting units at a cost of $22,600 per unit (see Wall 7 in Figure 4-5b).

Segment 7 – North of 12 Mile Road to 14 Mile Road

The west side of this segment is all commercial. On the east side of I-75, two walls were tested along the extensive apartment complex development (Lexington Village Apartments) north of 13-Mile Road (NB 1 and NB 2) (see Wall 8/9 in Figure 4-5b). The first of these walls was placed in the simulation at the outside shoulder edge as I-75 crosses over 13-Mile Road. The noise wall would begin at the north end of this bridge and extend along the shoulder edge to the point that the guardrail ends. At this point, a second wall would overlap the first, placed at the right-of-way line and extending north along the entire frontage of the apartment units. It would end near the 14 Mile Road interchange, where the off-ramp diverges from the main lanes of I-75. Placing a wall along the edge of this shoulder is an effective way to intercept noise from the freeway. This can only be done in a situation where there is a guardrail section so that the wall is protected from impact. The wall overlap would be sufficient to protect the apartment complex from noise escaping between the two walls and would allow for proper maintenance. The first wall segment would be approximately 660 feet long and 12 feet high. The second wall at the right-of-way line would be approximately 3,300 feet long and average about 13 feet in height. Combined, these walls would provide benefits to over 100 receptors at a cost of under $20,000 per benefiting receiver.

Segment 8 – 14 Mile Road to Rochester Road

A wall was tested on the west side of I-75 at Troy Mobile Home Villa located off Stephenson Highway. This wall would extend for approximately 1,200 feet at a height of 10 feet (see Wall 10 in Figure 4-5c). The wall would benefit some 17 homes at approximately $32,900 per home.

Segment 9 – Rochester Road to Livernois Road

Both sides of I-75 hold concentrations of apartment units in this segment. Two walls were modeled to protect the Charter Square Apartment complex on the north side of I-75 (northbound direction) (see Wall 11/12 in Figure 4-5c). The first (NB 1) would extend along the shoulder behind the guardrail from the west end of the bridge over Rochester Road, west approximately 700 feet with an average height of 11 feet. A second wall (NB 2) would continue along the right-of-way edge (with an overlap) for another 1,100 feet with a average height of 12 feet. In this apartment complex, the units on the first floor were found to be benefiting receivers where they have frontal exposure to the freeway. Second-story units were counted where the walls extend high enough to protect such units (as where the wall is built on the shoulder edge in elevated section). The first wall northbound would benefit 10 dwelling units at an average cost of approximately $33,300 per unit. The second wall would benefit at least 17 units at an average cost of approximately $33,900 per unit.

Two walls were similarly modeled southbound and found reasonable and feasible (see Wall 13/14 in Figure 4-5c). The northernmost of these two (SB 1) would be at the shoulder protected by a guardrail and would extend for approximately 650 feet at a height of 10 feet. The second wall further south (SB 2) would extend another 2,400 feet at the right-of-way edge, with an average height of 13 feet. The first wall would afford protection to approximately 24 dwelling units at a cost of $12,300 per unit. The second wall would benefit about 83 receivers at a cost of approximately $15,200 per unit.

Segment 10 – Livernois Road to Wattles Road

On the east side of I-75 between Big Beaver and Wattles Road, the Lane Drain occupies an extra-wide right-of-way contiguous with I-75, so 300 feet separates the centerline of I-75 from the east right-of-way line. The Lane Drain occupies this area. City of Troy parkland is on the east side in this section, including their Family Aquatic Center. A berm on the order of 20 to 25 feet high separates the roadway from the park area. This, in addition to the extra-wide right-of-way occupied by the Lane Drain results in no noise impacts to the park area. Further north, the same situation is true for the Meadowbrook Subdivision.

On the west side of I-75 in this segment, there is an extensive patio home/condominium development. There is an existing low berm that affords the development some noise protection. Analysis finds that a wall 2700 feet long would afford protection in this segment to about 50 units at a cost of $26,600 per unit (see Wall 15 in Figure 4-5c).

Segment 11 – Wattles Road to Coolidge Highway

The midsection of this segment falls within the separate Crooks/Long Lake interchange project. The southern section, which falls in the I-75 project, consists on the east side of very dispersed single-family residences that do not have sufficient density to make a noise wall in this area reasonable. On the west side of I-75 north of Wattles Road is the Three Oaks Apartment complex. The intervening distance between the apartments and I-75 would require a very long wall to provide adequate protection. The length of such a wall would make the cost prohibitive and not considered reasonable based on the number of units that could be protected.

West of Crooks Road, Square Lake Road parallels the north side of I-75. Single-family dwelling units face away from Square Lake to an internal subdivision road. Square Lake Road generates too much noise to allow a noise wall between I-75 and Square Lake Road to be feasible. This condition is also affected by the distance between I-75 and the dwelling units.

The south side of I-75 between Coolidge Highway and Crooks Road includes a subdivision street (Fleetwood Drive) that is part of Northfield Hills to the west and condominium/patio home development to the east. Each can be afforded reasonable and feasible walls. SB 1 & 2 (combined) would protect homes on Fleetwood Drive (see Wall 16 in Figure 4-5d). It would be 2,100 feet long and average 12 feet high, and would be located along the shoulder of I-75. The cost per benefiting unit would be $30,600. The condominium patio home area to the east did not have sufficient density to support a wall. The wall protecting the closest condominium patio homes was too short (SB 3). The distance of the units from I-75 varies, and not enough units are close enough to I-75 to benefit from a wall. A low berm is also present that makes a feasible wall difficult to achieve.

Segment 12 Coolidge Highway to North Project Limit

West and north of Coolidge Highway there is residential development, but it is of low density and/or set back farther from I-75 than homes further south. One subdivision to the south of I-75 has a substantial berm on private property (Beach Forest). Further west, near the I-75 crossing of Square Lake Road, the area to the south is elevated well above I-75 and noise measurements did not approach or exceed noise abatement criteria. West of Adams Road and north of I-75 is a patio home development (Adams Woods) with its own noise wall. This wall is effective enough that a new full height MDOT wall outside this private wall would not be feasible or reasonable, when considering the minimal additional noise mitigation the MDOT wall would provide.

At the Square Lake Road interchange, the existing noise wall was lengthened and a new wall constructed in the fall of 2003. The location of these walls is shown on Figure 4-5e.

Conclusion

Based on the noise analysis, MDOT intends to implement the mitigation measures that are feasible and reasonable. Seventeen barriers meet the criteria. The wall in the northeast quadrant of the I-696 interchange would be replaced. Because the analysis of the noise impacts and mitigation measures are based on preliminary design (planning), the mitigation measures will be reviewed as a part of final design. A final decision on noise barrier installation will be made upon completion of the next phase (design) and public involvement process.

4.9 Threatened and Endangered Species

Threatened and endangered species are officially protected in Michigan by both federal and state Endangered Species Acts: Public Law 93-205 and Part 365 of PA 451, the Michigan Natural Resources and Environmental Protection Act of 1994, respectively. An endangered species (E) under the acts is defined as in danger of extinction throughout all or a significant portion of its range. A threatened species (T) under the acts is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Special concern species (SC) are not afforded legal protection under the acts. They are species with declining or relict populations in Michigan or are species for which more information is needed.

In a letter dated September 16, 2002, the Michigan Department of Natural Resources (MDNR), Wildlife Division that keeps the Michigan Natural Features Inventory (MNFI - the most complete database available for all of Michigan's T/E/SC species), notes "the project should have no impact on rare or unique natural features" (Appendix B, Section 2). In a letter dated March 21, 2003, the U.S. Fish and Wildlife Service indicated it had not found any federally-listed species as endangered or threatened, or species proposed for listing (Appendix B, Section 2) in the I-75 corridor.

Although the corridor is a largely developed urban corridor, a biological field review was conducted in conjunction with the wetland analysis along I-75 (spring and early summer of 2003) to ensure there would be no effect on federal threatened or endangered species or state-listed species.[2] None were found (see results of field work in Section 4.10.1 under discussion of River Rouge).

4.10 Surface Water Features/Water Quality/Floodplains

A comprehensive drainage study was performed. Results of that study enhanced the information in this section.[3]

4.10.1 Waterways and Drains

The information below is drawn from analysis performed for the wetland analysis, from a drainage study performed in 2000[4], and from a drainage study associated with this EIS. Additional analysis results will be reported in this section in the Final EIS.

The study area contains or crosses surface water features including Red Run Creek, Thurby Drain, 13 Mile Drain, Warner Drain, McDonald Drain, Spencer Drain, Roth Drain, Swan Drain, Mastin Drain, Huber Drain, Lane Drain, Wattles Road Drain, Amy Drain, Levison Drain, and the River Rouge (two crossings), along with a number of unnamed drains. The drains generally carry storm water from northwest to southeast and carry water from small areas.

The Clinton River is within the limits of the separate I-75/M-59 project. Two small ponds and several storm water detention basins also occur in or adjacent to the road right-of-way. Roadside drainage ditches border I-75 north of 12 Mile Road. Emergent, scrub-shrub, forested, and open-water wetlands are associated with some ditches (see Section 4.11).

For the most part, waterways, drains, and ditches will not be affected by construction associated with the build alternatives because construction of the additional lane will be in the median and most of the culverts extend uninterrupted, underneath the roadbed, with no break at the median. At this time no extension of any pipe or culvert is expected to exceed 24 feet. This will be confirmed in final design. The existing condition of each crossing is shown in Table 4-15, together with anticipated changes. The only crossings that serve an area greater than 2 square miles are Spencer Drain, south of Maple Road and the River Rouge at its crossing east of

[2] *Wetland Report*, Tilton and Associates, Inc. October 2003.
[3] *Drainage Study - M-102 to M-59*, Orchard Hiltz & McCliment and Rowe, Inc., November 2003.
[4] *I-75 from 12 Mile Road to Adams Road Drainage Study*, CH2M Hill, May 2000.

Table 4-15
Waterway Crossing Characteristics
(Likely *Replacements* [in bold Italics] and Drainage Areas Greater Than 2 Square Miles [in Bold])

Water Crossing Name	Setting	Existing Structure Type	Proposed Work	Drainage Area	
				Acres	Sq. Mile
Red Run Creek – N of 12 Mile Road	Commercial	Bridge	Bridge removal[a]	NA	NA
Thurby Drain – between 12 and 13 Mile Roads	Commercial	24" Culvert, 18" outlet	None at this time[b]	13	0.02
13 Mile Drain – south of 13 Mile Road	Commercial	24" Concrete w/end sections	None at this time[b]	7	0.01
Unnamed Drain – midway between 13 and 14 Mile Roads	Commercial	36" Concrete w/end sections	None at this time[b]	12	0.02
Warner Drain – N of 14 Mile Road	Commercial	36" Concrete w/end sections	None at this time[b]	19	0.03
McDonald Drain – midway between 14 Mile Road and Maple Road	Commercial	78" Concrete pipe (enclosed)[c]	None at this time[b]	NA	NA
Spencer (Barnard) Drain – S of Maple Road	**Commercial**	**14' x 6' Box culvert, 15' Tunnel**	**None at this time[b]**	**2200**	**3.44**
Roth Drain – N of Maple Road	Commercial	90" Concrete tunnel[c]	None at this time[b]	NA	NA
Roth Drain – W of Rochester Road	Commercial	48" Tunnel[c]	None at this time[b]	51	0.08
Swan Drain – between Livernois and Rochester Roads	Apartments	36" Concrete w/end sections	None at this time[b]	45	0.07
Spencer Drain – W of Swan Drain	Apartments	42" Concrete	None at this time[b]	70	0.11
Mastin Drain – W of Livernois	Commercial	72" Tunnel[c]	None at this time[b]	22	0.03
Mastin Drain Tributary – W of Mastin Drain	Commercial	42" Concrete w/headwalls	None at this time[b]	61	0.10
Huber Drain - in Big Beaver interchange, N side	Commercial	60" Culvert	None at this time[b]	457	0.71
Lane Drain –S of Wattles Road	***Apt./Single-family***	***58" x 91" Helical elliptical***	***Replace[d]***	***790***	***1.23***
Wattles Road – at Wattles Road	Residential	24" Concrete w/headwalls	None at this time[b]	5	0.01
Unnamed Drain – N of Wattles Road	***Residential***	***43" x 68" Helical elliptical***	***Replace[d]***	***181***	***0.28***
River Rouge – midway between Coolidge and Crooks Roads	**Apt./Single-family**	**Twin 9' x 8.5' Box culverts w/headwalls**	**None at this time[b]**	**5100**	**7.97**
River Rouge – E of Squirrel Road	***Apt./Single-family***	***72" x 113" Helical eliptical w/headwalls***	***Replace[d]***	***373***	***0.58***
Amy Drain – in Square Lake interchange, southbound I-75 lanes	Apt./Single-family	5' x 10' Box culvert w/headwalls	None at this time[b]	209	0.33
Amy Drain – in Square Lake interchange, northbound I-75 lanes	Apt./Single-family	5' x 10' Box culvert w/headwalls	None at this time[b]	156	0.24
Levison Drain	Single family	Tunnel[c]	None at this time[b]	NA	NA

Source: Rowe Inc., The Corradino Group of Michigan, Inc., Tilton and Associates, and CH2M Hill
NA means Not Applicable.
[a] The need for the bridge has been eliminated with the construction of a Combined Sewer Overflow (CSO) tunnel system upgrade, including the Twelve Town Retention Treatment Facility, which occupies the former Red Run Drain and carries water underground, rather than on the surface.
[b] The drainage system appears to be adequate. Replacement in kind may be necessary due to condition only.
[c] Enclosed and "tunnel" mean the drain passes under the right-of-way without surfacing, and would not be affected by the project.
[d] Helical elliptical is a metal pipe that due to material type would likely be replaced with reconstruction of I-75.

Deleted: s Drain and

Coolidge Road.[5] No changes are anticipated at these two locations. The helical elliptical metal pipe serving the River Rouge crossing east of Squirrel Road will likely be replaced. Other such pipes at Lane Drain and an unnamed drain north of Wattles Road would also likely be replaced.

The following paragraphs describe the watercourses associated with this project. If aquatic habitat is present, it is also described.

Red Run Creek
Red Run Creek is now enclosed underground as part of a Combined Sewer Overflow (CSO) tunnel system upgrade, including the Twelve Town Retention Treatment Facility. I-75 passes over Red Run with a bridge structure just north of 12 Mile Road. As drainage is now underground at this location the need for a bridge at this location has been eliminated and it will be removed.

Thurby Drain
This 24-inch reinforced concrete culvert is midway between 12 Mile Road and 13 Mile Road. It is surrounded by vegetation and was 50 percent full of water at the time of investigation (April 2000).[6]

13 Mile Drain
This drain flows under I-75 in a 24-inch reinforced concrete culvert from west to east just south of 13 Mile Road. There is no break in the culvert from ditch to ditch. Standing water is present in the culvert under I-75. The channel flows to the north along the east side of I-75, just inside the ROW. The channel is a well-vegetated swale that may have pockets of standing water during the growing season. However, flow is only present during precipitation runoff. This drain does not likely contain lotic (moving water) habitat that could be impacted from I-75 expansion. Although the vegetation communities associated with the drain along I-75 are of low quality, the present habitat does have some wildlife value. Wildlife that may be associated with this habitat includes frogs, songbirds, rabbits, raccoons, squirrels, voles, mice, and birds-of-prey. Small mammal (mostly rabbit) tracks were observed in the snow on February 26, 2003.

Unnamed Drain
Between 13 Mile Road and 14 Mile Road is a 36” unnamed drain that cross I-75 in concrete pipe.

Warner Drain
Warner Drain passes west to east under I-75 just north of 14 Mile Road in a 36-inch reinforced concrete culvert. The upstream end of the culvert is damaged.

McDonald Drain
This drain is totally enclosed and would not be affected by the project.

Spencer Drain (Barnard Drain)
Spencer Drain is a 14-foot by 6-foot reinforced concrete box culvert crossed by I-75 just south of Maple Road. It flows from west to east after exiting a storm water retention basin on private property on the west side of I-75. There is no break in the culvert from ditch to ditch. Three blunt-nose minnows and one crayfish were observed on an ice shelf in spring 2003 just downstream of a retention basin. Likely these were washed from the retention basin during

Comment:
Comment:

[5] *Drainage Study - M-102 to M-59*, Orchard Hiltz & McCliment and Rowe, Inc., November 2003.
[6] *I-75 from 12 Mile Road to Adams Road Drainage Study*, CH2M Hill, May 2000.

recent high flows from snowmelt runoff. No aquatic insects in the open channel downstream (east) of the highway were observed. The channel bed was silted and algal growth on the substrates was heavy. Dissolved oxygen concentrations may be low during periods of high temperatures and low flow. This situation alone would limit the survival of fish and all but the most tolerant aquatic invertebrates. The reach immediately downstream of the highway contained some pool-riffle diversity formed from concrete rubble. The highway culvert creates poor lotic habitat, and probably prevents fish passage; the water depth is too shallow at low flows and velocities are too high at higher flows.

Roth Drain (two locations)
Roth Drain is in tunnel under I-75 and is connected to the surface only by storm water inlets.

Swan Drain
This drain carries water from north to south under I-75 just east of midway between Livernois Road and Rochester Road. The 36-inch reinforced concrete culvert was partially submerged at the time of investigation (April 2000). On the north side is a detention pond associated with an apartment complex.

Spencer Drain
This is a 42" concrete pipe midway between Rochester Road and Livernois Road.

Mastin Drain and Mastin Drain Tributary
The Mastin Drain itself is in tunnel and would be unaffected by the project. Its tributary is in a 42" concrete pipe. They are close to one another west of Livernois Road.

Sturgis Drain
The Sturgis Drain parallels the north side of the curve of I-75, east of the Rochester Road interchange. It is not crossed by I-75.

Huber Drain
Huber Drain is a 60-inch reinforced concrete culvert crossing under I-75 on the north side of the Big Beaver interchange. It flows from west to east. There was standing water at the time of inspection (April 2000).

Lane Drain
Lane Drain is a branch of the Sturgis Drain. It flows from west to east in an enclosed 91 x 58 inch elliptical culvert from ditch to ditch south of Wattles Road and adjoins the right-of-way of I-75 for some distance to the south. There is evidence of accelerated water velocities downstream of I-75, leading to channel instability. Bed incision and bank erosion are evident. The channel bed consists of highly erodible coarse sands and fine gravels. Even under moderate flow, this material is easily transported, resulting in poor habitat quality. Site conditions suggest that the water flow rate is highly variable. In February 2003, base flow was minimal, yet flow debris was observed in vegetation approximately 2 to 3 feet above that base flow. Although the channel has some structural and flow diversity, the overall habitat for stream organisms is poor.

Wattles Road Drain
This is a 24-inch reinforced concrete culvert flowing west to east, south of Wattles Road.

Unnamed Drain
This is a 43 x 68 inch helical elliptical metal pipe flowing from west to east, north of Wattles Road. It would likely be replaced to update the pipe material.

River Rouge Main Branch Between Coolidge Highway and Crooks Road
I-75 crosses the River Rouge twice. The more easterly crossing is of the Main Branch and is between Coolidge Highway and Crooks Road. The second is further west near Squirrel Road.

The first crossing is over the Main Branch, where the channel width is approximately 12 feet and average depth is approximately 0.5 feet. The flow is from north to south. It is contained in twin 9 x 8.5-foot box culverts that stretch from ditch to ditch. Base flow was good at this site when observed in February 2003. The Main Branch is channelized upstream (north) of I-75 and the habitat quality is poor. Downstream of I-75, the Main Branch contains some meanders and more structural diversity. Lotic habitat is fair to good. In 1986 and 1995, MDNR, Fisheries Division conducted rapid bioassessments at Beach Road, approximately 1.5 river miles downstream of I-75.[7] Using an Index of Biological Integrity (IBI), the MDNR rated the fish community at this location of the Rouge River as "Fair" to "Good" in 1986 and as "Fair" in 1995. MDNR also used Great Lakes Environmental Assessment Standard Procedure 51 (P51) in 1995 to assess habitat quality and rate the fish community. Using P51, MDNR rated the habitat at this site as "Poor," and rated the fish community as "Good – Slightly Impaired." An independent P51 rapid assessment performed for this DEIS (April 2003)[8] found the biological integrity of the fish and macroinvertebrate community to be "acceptable" and "acceptable, tending toward poor," respectively.

Although habitat is "good, tending toward marginal," the riparian corridor is affected by housing developments, where woody vegetation is absent and turf grass is maintained to the top of bank. Pool and riffle habitat is present, but limited during low summer flows. Excess nutrient loading may also cause dissolved oxygen sags and high water temperatures during low flow. A species listing found during field investigations is attached to the *Wetlands Report* as an appendix.

In summary, the reach of the Rouge River Main Branch downstream of I-75 has fair to good habitat and biological integrity. Sediment loading during construction and increased storm water volume after construction could impact the biological communities. Sections 5.3 and 5.4 outline mitigation to be used at this location.

River Rouge at Squirrel Road (Sprague Branch)
The second crossing of the River Rouge is east of Squirrel Road. It is contained in a 72 x 113 inch helical elliptical metal pipe from ditch to ditch with a south to north flow. This is in the headwaters of Sprague Branch. Surface flow is minimal and poorly defined. There is a wetland system with diffused, low gradient surface flow. While the lotic habitat at this crossing is limited, the floristic and wildlife habitat quality are high. Further, this headwater area is important to the overall function and biological productivity of the Main Branch Rouge River. Based on topology and geology, this corridor could be a source for groundwater recharge for the River Rouge headwaters. Wildlife that may be associated with this habitat includes turtles, frogs, songbirds, rabbits, raccoons, squirrels, weasels, mink, fox, coyote, mice, and birds-of-prey. No frogs, toads, snakes, turtles, or terrestrial or flying invertebrates were observed during a site visit by a qualified biologist in May 2003. (Roadway noise made it very difficult to hear bird or frog calls). North of I-75, 36 plant species were identified and six birds. White tail deer tracks were observed. South of I-75, 17 plant species were observed. No species were observed which are state or

[7] *An Assessment of the Rouge River Fish Community*, Michigan Department of Natural Resources, Fisheries Division, June 14, 1996.
[8] *Wetlands Report*, Tilton and Associates, Inc., October 2003.

federally-listed as threatened or endangered. It is likely that this metal pipe will be replaced, as this kind of pipe is no longer used. Sections 5.3 and 5.4 outline mitigation.

Amy Drain
I-75 crosses Amy Drain west of Squirrel Road. Amy Drain flows northeast to southwest and is enclosed. Amy Drain is enclosed in a 5 x 10 foot box culvert that passes beneath the northbound lanes of I-75. It then opens into an in-line storm water detention basin. It then passes through another 5 x 10 foot box culvert under the southbound lanes of I-75 and connects to the ditch along the southern roadway edge. There is no lotic habitat associated with Amy Drain. The median area is mowed. Lentic (still water) habitat associated with storm water infrastructure is of poor quality.

Levison Drain
This drain flows under I-75 with no connection to the surface.

Summary of Impacts

The lane addition to I-75 would cross two watersheds of greater than two square miles - Spencer Drain and the main channel of the River Rouge between Crooks and Coolidge roads (Table 4-15). In neither case will the structures carrying these watercourses be affected, as the freeway widening is to the inside in the median area and the structures carry all the way across the freeway to the ditch lines. Replacement of three drains is likely, Lane Drain south of Wattles Road, an unnamed drain north of Wattles Road, and the River Rouge east of Squirrel Road.

The proposed lane addition would add approximately 20 percent to the amount of impervious surface of I-75. This increase is minor compared to the adjacent watersheds. Detention would be provided to offset the increased impervious surface. One detention site has been identified.

There will be no loss of stream bank habitat or changes to the bed of the River Rouge, so there will be no long-term effect on macroinvertebrates, including snails, clams, or insects.

The potential for impact to this wildlife, including direct loss of habitat and indirect effects of increased volumes of salts and other constituents that may be carried in the runoff from road surfaces will be minimized through mitigation efforts. Absorbent drainage structures such as grassed swales, where feasible, would minimize the inputs of water-borne contaminants that would otherwise flow directly to the River Rouge and drains.

4.10.2 Water Quality and Groundwater

Through early coordination, MDEQ has indicated that discharge from storm water sewers into open water is discouraged. MDOT and MDEQ agree that filtration through vegetation, rather than the use of detention basins, is preferred. However, due to capacity limitations of drains in the region, detention may be necessary to prevent an increase in the flow rate of storm water from I-75. When detention is needed, a “two-cell” pond approach is recommended. This allows settlement of debris and sediment. The ongoing drainage analysis will report on potential detention areas. That information will be summarized in the Final EIS.

Planning is also occurring in conjunction with this DEIS to separate the storm water now flowing from the depressed section of I-75 between 8 and 12 Mile Roads into a combined sewer system. The proposed project will separate such flow, reducing the need to bypass the sewage treatment plant during storms. The result will be substantially improved water quality.

MDEQ is working with communities in the state to establish wellhead protection plans to protect drinking water drawn from groundwater. Many plans are being developed, but none are close to I-75 and none will be affected by the project. The nearest of such plans in Oakland County are all quite a distance from the project, in the townships of Lyon, Independence, Highland, and the communities of Oxford, Milford, South Lyon and Holly.

Groundwater flow will not be substantially affected by the project. There will be no disturbance of bedrock. I-75 is in a cut section between M-102 (8 Mile Road) and Gardenia. The deepest proposed cut will match the existing road profile and the cuts will be into earthen embankments. Otherwise, the roadbed is built up relative to the surrounding ground. Thus, the effects on groundwater flow will be insignificant.

4.10.3 Floodways and Floodplains

The *Drainage Study* performed for this project finds there will be no encroachment on any regulatory floodway (the main channel that carries water). Floodplain (the area into which water extends during periods of flooding) will likewise not be affected (Figure 4-5). The analysis performed was consistent with 23 CFR 650 and Executive Order 11998. Floodplain analysis must examine whether a project creates or increases a hazard to people and/or property, and whether there is an impact on natural and beneficial floodplain values. These values include: fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

The *Drainage Study* makes recommendations for structures. These were designed to prevent the base floodplain elevation from causing a harmful interference at any natural crossing. All structures will pass the 100-year storm flow. Thus, no significant hazard to people or property will result from the project.

Wetlands associated with the floodways and floodplains have been identified (see next section). The analysis finds that the project will not result in a substantial loss in natural and beneficial floodplain values as measures to minimize the project's impact on wetlands and to restore their flood control values are incorporated into the project's design.

4.11 Wetlands

4.11.1 Methodology

The project traverses two regional landscape ecosystem types: the Maumee Lake Plain and the Ann Arbor Moraines. The former consists of flat, clay lake plains dissected by broad sandy glacial drainage ways. Lacustrine (lake) deposits range from five to 100 feet thick over bedrock. Glacial landforms include clay lake plains intermingled with broad channels of lacustrine sand. Other landforms include end moraines in the northern part of the region. Beach ridges and sand dunes also occur. Ann Arbor Moraines are fine and medium-textured ground and end moraines, consisting of glacial drift 100 to 250 feet thick. Ground moraines of less than 6 percent slope form broad plains, whereas end moraine ridges have slopes up to 15 percent. These landforms often include wetlands.

As a result of the presence of historic wetlands and engineered drainage ditches, MDOT in conjunction with MDEQ delineated wetlands within the MDOT right-of-way, but not where the

"wetland" area was originally engineered as a ditch for purposes of drainage. Also excluded are the slopes leading from the roadway down to the ditch or wetland.

The wetland delineation began with a review of available plan sheets dating from the early 1980s. In summary, areas mapped as wetland in the highway right-of-way met one or more of the following conditions:

- Wetlands contiguous to a lake, stream, pond, or drain. Open water areas found between the ordinary high water marks of streams and drains were excluded from wetland impact area calculations.
- Wetlands found in depressions that were significantly wider than the typical ditch profile.
- Wetlands found that were part of a larger wetland adjacent to the right-of-way.
- Wetlands shown in the National Wetland Inventory (1982) and presumed to pre-date the construction of I-75.

The methodology used to identify wetlands was consistent with that used by MDEQ and the U.S. Army Corps of Engineers (Environmental Laboratory 1987, MDEQ 2001). Wetlands were delineated using a combination of USGS topographic maps (1:24,000), National Wetland Inventory (NWI) maps (1:24,000), Q3-level digital flood insurance rate maps (digital Q3 FIRMs, scale variable), the Soil Survey Oakland County, Michigan (Feenstra 1982), inspection of aerial photographs, and on-site field investigations. Three parameters considered in delineating wetlands are vegetation, soils, and hydrology.

Dominant vegetation was identified to the species level. The percentage areal cover within the wetland community and wetland indicator status of each was then determined. The wetland indicators are from the U. S. Fish & Wildlife Service's *National List of Plant Species that Occur in Wetlands* (Reed 1988), or, for species not classified in Reed (1988), Appendix C (Michigan Plants Database – 1996) of the *Floristic Quality Assessment with Wetland Categories and Computer Application Programs for the State of Michigan* (Herman *et al*. 1996). *The National List* (and Herman *et al.* 1996) identifies plant species known to occur in wetlands and assigns each a wetland indicator (probability of occurring in wetlands) based on that species' affinity for wetland habitat.

Soil sampling and hydric soil evaluation was based on information in the *Soil Survey of Oakland County, Michigan* (Feenstra 1982) and on-site examination of soils, in accordance with the methodologies outlined in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and in the *Field Indicators of Hydric Soils in the United States, Version 4.0* (USDA-NRCS 1998).

4.11.2 Wetland Functions and Priorities

Wetlands were rated according to their functional values, ecological complexity, and biological integrity. The highest scoring (Priority 1) wetlands are generally forested, and/or part of a large wetland complex, and/or provide significant wildlife habitat, greater than average plant biodiversity, or unusual potential for water quality enhancement. Priority 3 wetlands score lowest and are associated with roadside depressions dominated by cattails (Typha spp.), reed canary grass (Phalaris arundinacea), or reed grass (Phragmites australis). They have low-biodiversity and non-native species, and are generally easier to replicate through compensatory mitigation.

Intermediate-scoring (Priority 2) wetlands have functional values between those of Priority 1 and 3 wetlands.

4.11.3 Delineation Summary

Forty-one wetlands were identified and flagged within the proposed highway right-of-way.[9] Six were forested (PFO) wetlands, 13 were emergent (PEM) wetlands, and five were scrub-shrub (PSS) wetlands. In addition, there were 12 stands of mixed emergent and scrub-shrub (PEM/PSS) wetlands, one stand of mixed emergent and forested (PEM/PFO) wetlands, two stands of mixed scrub-shrub and forested (PSS/PFO) wetlands, one stand of mixed emergent, scrub-shrub, and forested (PEM/PSS/PFO) wetlands, and one stand of mixed emergent, forested, and open water (PEM/PSS/POW) wetlands. Three wetlands were considered Priority 1, 16 were considered Priority 2, and 22 were considered Priority 3.

4.11.4 Impacts

Wetlands are limited to the area north of 12 Mile Road. The proposed lane addition would occur in the median, and wetlands are primarily located in ditch areas. The project includes major reconstruction of the interstate. Ordinarily the disturbance limits of construction equipment are broad in such circumstances. Due to the presence of wetlands along I-75, construction contracts will specify that there be no disturbance in wetland areas.

Impacts to wetlands would occur with the HOV Alternative only. The GP Alternative would not affect any wetlands. Impacts to wetlands under the HOV Alternative would occur at two wetlands, W39 and W41 in the Square Lake interchange. The characteristics of these wetlands are shown in Table 4-16.

A preliminary determination has been made with respect to mitigation, based on the criteria outlined in Part 303, Wetland Protection, of the Natural Resources and Environmental Protection Act 451 of 1994, as amended. Any dredging, filling, or construction in regulated wetlands requires an MDEQ permit before beginning the construction activity. A permit applicant must demonstrate that the activity is dependent on being located in the wetland, and/or no feasible or prudent alternative exists that would avoid or minimize the impact. If the HOV Alternative were selected, design standards guide how the HOV lane would traverse the Square Lake Road interchange, and its alignment could not avoid the wetlands.

The MDEQ considers the magnitude and justification of the impact in granting a permit. The permit is expected to require compensatory mitigation, which is the creation of wetland to replace the affected acreage. The Palustrine Emergent (PEM) and Palustrine Shrub/Scrub (PSS) wetlands affected by this project are usually mitigated at a 1.5 to 1 ratio. The tentative conclusion is that approximately 0.41 acres of wetland are subject to mitigation, with a likely mitigation need of about 0.61 acres (Table 4-17). Mitigation is discussed further in Section 5.14.

[9] *Wetlands Report*, Tilton and Associates, Inc. October 2003.

Table 4-16
Summary of Wetland Characteristics – Impacted Wetlands

Wetland ID	Priority Class	Wetland Community Classification	Wetland Area (acres)	POW PSS PEM	Lake Fringe or PFO	Description
W39	2	PSS/PEM	0.89	0.89	0.00	**Vegetation**: Willows (*Salix* spp.), glossy buckthorn (*Rhamnus frangula*), narrow-leaf cattail (*Typha angustifolia*), tussock sedge (*Carex stricta*). **Soils**: Loam soils with low-chroma matrix and redox concentrations. HS indicator: F3. **Hydrology**: partial saturation within 12 inches of the ground surface, drainage pattern, partial inundation.
W41	3	PEM/PSS	0.16	0.16	0.00	**Vegetation**: Narrow-leaf cattail (*Typha angustifolia*), hard-stem bulrush (*Scirpus acutus*), sedges (*Carex* spp.), glossy buckthorn (*Rhamnus frangula*). **Soils**: Loamy fine sand with low-chroma matrix and redox concentrations. HS indicator S5. **Hydrology**: Drainage pattern.
Total			**1.05**	**1.05**	**0.00**	

Source: Tilton and Associates, Inc.
Note: All wetland impacts will be mitigated because of the use of federal funds (E.O. 11990).
[a]Priority classes applied to this project were: 1, highest quality; 2, medium quality; and 3, lowest quality.
[b]PEM – Palustrine emergent; PFO – Palustrine forested; PSS – Palustrine shrub-scrub; Palustrine Open Water - POW.
[c] "Drainage pattern" means there is a visible drainage pattern showing a flow of water.

Table 4-17
Estimated Wetland Impacts and Potential Compensatory Mitigation

Wetland Type	Wetland	Estimated Impact (acres)	Probable Mitigation Ratio	Estimated Compensatory Mitigation (acres)
PEM/PSS	W39	0.25	1.5 to 1	0.37
PEM/PSS	W41	0.16	1.5 to 1	0.24
Total		0.41		0.61

Source: Tilton and Associates, Inc.

4.12 Historic and Archaeological Resources – Section 106

There are established criteria for determining historic significance and eligibility for the *National Register of Historic Places.* A property must have integrity of location, design, setting, materials, workmanship, feeling, and association. Additionally, the property must be fifty years old or older, and meet one of the following criteria: a) be associated with a significant event; b) be associated with the lives of significant persons; c) embody the distinctive characteristics of a type, period or method of construction, or represent the work of a master; or, d) have yielded or may be likely to yield information important in history or prehistory (usually archaeological sites).

For Section 106 of the National Historic Preservation Act and Section 4(f) of the Department of Transportation Act, MDOT contacted the Michigan State Historic Preservation Office (SHPO) for help in identifying project area historic and archaeological sites. Cultural resource surveys began by delineating an Area of Potential Effect (APE) for the project. The APE represents the maximum area potentially affected, both directly and indirectly, by the project and was approved by the State Historic Preservation Office (SHPO) (see letter dated October 1, 2003, Appendix B, Section 2).

Surveys of historic and archaeological resources took place within the APE in 2002 and 2003. The survey results and project impacts are described in the *Phase I Cultural Resources Survey of the Proposed I-75 Improvement Between M-102 and M-59 Oakland County, Michigan.*[10] As there are no properties on or eligible for listing on the *National Register* within the approved Area of Potential Effect, there are no effects on any such properties, and no further analysis is necessary. The SHPO concurred (see letter dated May 14, 2003, Appendix B, Section 2).

4.13 Parkland – Section 4(f) and Section 6(f) Resources

No Section 4(f) or Section 6(f) parkland is affected by the proposed project. Section 4(f) of the Department of Transportation Act of 1966 protects parklands (and *National Register* eligible historic sites) from transportation uses. Section 6(f) lands are those developed or purchased with federal Land and Water Conservation Funds. Maddock Park and the Troy Family Aquatic Center are contiguous to the project. A third park, Firefighters Park, is near I-75, but is separated from I-75 by Square Lake Road, west of Crooks Road. None will be affected by the project.

Maddock Park is in Royal Oak on the west side of the southbound service drive between Lincoln Avenue and Kalama Avenue (south of 11 Mile Road, Figure 4-1a). There is a noise wall between the southbound service drive and this depressed section of I-75. It shields the park from I-75 noise. A grading permit may be necessary to reconstruct a short section of the service drive near the park, but no permit is needed for the park. The noise wall will remain with the project. Therefore, there is no affect on this park.

The Troy Family Aquatic Center is north of Big Beaver Road on the east of I-75 (Figure 4-1c). It is separated from I-75 by an earth berm approximately 25 feet high. I-75 is not visible from the park, and the park is not visible from I-75. There would be no change in noise and there would be no affect on this park.

As Firefighters Park is separated from I-75 by Square Lake Road and there are no noise effects, there would be no effect on this park.

4.14 Visual Conditions

Visual effects relate to the view of the road and from the road for each of I-75's two distinct sections. The depressed section, between M-102 and 12 Mile Road, is flanked by grassy banks and occasional ornamental trees (Figure 1-1). Drivers see only the road, bridges over I-75, embankments on either side, and adjacent buildings. With the project some remnants of grassy banks may remain in wider areas of the depressed section, but overall there will be a more monolithic concrete visual environment, including a concrete median safety barrier. Portions of

[10] *Phase I Cultural Resources Survey of the Proposed I-75 Improvement Between M-102 and M-59 Oakland County, Michigan*, Commonwealth Cultural Resources Group, December 2002.

the depressed section between I-696 and Gardenia are bordered by brick noise walls at the top of the grassy banks. The noise walls will remain (though some may be relocated). Additional noise walls will be built, subject to final analysis and community acceptance. The view of the road in the depressed section is limited, as the road is below grade level. This will change where noise walls are added. The walls will be evident from the surrounding area with the project.

The northern at-grade/elevated section has a grassy median. Construction of either build alternative will remove this vegetation. North of 12 Mile Road, I-75 is generally above the surrounding landscape at cross roads, so the adjacent land uses are visible. These views will not change as a result of the project. Since construction during the 1960s, vegetation has grown up along the fence lines. The mature vegetation along fence lines should not be disturbed with the project except in areas where noise walls are built. The view from the road would change only in these areas where noise walls are built. Likewise the view of the road will not change as the widening is within the median. Some clearance of vegetation is recommended for safety purposes (sight distance) within interchanges at Big Beaver Road and Rochester Road.

Design elements of the proposed project would be refined in conjunction with the Crooks/Long Lake I-75 Interchange Project and the I-75/M-59 Interchange Project.

4.15 Contaminated Sites

A *Project Area Contamination Survey* (PACS) was conducted.[11] The survey included a reconnaissance of the project corridor and review of federal and state environmental records.

The GP and/or HOV Alternatives are anticipated to require approximately 4 acres of new right-of-way from a mix of residential and commercial lots. An additional 7 acres could be acquired for storm water detention. One site in Royal Oak where right-of-way acquisition is expected was identified as a possible former gas station with underground storage tanks (UST). This site was rated medium/high for contamination potential and additional investigation of the site (Phase II) is recommended. The other commercial sites that could be acquired were rated low for contamination potential.

The review of federal and state environmental records identified 49 listed sites within the project corridor (Table 4-18 and Figure 4-5). None would be subject to acquisition. Most of these were UST sites and/or permitted small- quantity hazardous waste generators. These sites were rated for their contamination potential based on their proximity to I-75 and their current environmental condition. Three of the 49 sites would be acquired with the build alternatives. Construction of the SPUI would add a fourth. Three of the four were rated medium for contamination potential. All of these were leaking UST sites. The other sites were rated low for contamination potential.

The primary concern to the project from nearby sites is the possibility that contamination from leaking USTs or other sources at nearby properties has migrated onto or beneath the I-75 right-of-way. The *Project Area Contamination Survey* recommended that provisions be made to address contaminated soil and groundwater if encountered during construction.

[11] *Project Area Contamination Survey*, The Corradino Group, October 2003.

Table 4-18
Contamination Summary

SID No.	Site Name	Address or Location	City	Federal Records Databases				State Records Databases					Build Alternative	
				NPL	CERCLIS	RCRIS	ERNS	State Haz. Waste	State Landfill	LUST	UST	Inactive Solid Waste Facilities	ROW[1] (W/A/N)	Contamination Potential Rating
5	MDOT Bridge I-75 over M-59	NB and SB	Auburn Hills			X							W	L
6	Northeast LF & Sand Co	2715 Churchill N of Auburn	Pontiac									X	N	L
9	Goddard Coatings Co*	2280 Auburn Rd	Auburn Hills					X		X	X		N	L
17	Saltarelli Landfill	SE Corner Auburn/Opdyke Rd	Pontiac									X	N	L
20	Auburn Court Associates*	2740 Auburn Ct	Auburn Hills			X	X	X		X	X		N	L
30	Kamax-G B Dupont LP*	500 W Long Lake Rd	Troy			X				X-c	X		A	L
53	Sunoco Service Station	911 W Big Beaver-Suite 411	Troy			X							A	L
76	Humboldt Investment Co*	1864-80 Austin Road	Troy			X				X	X		N	L
96	Knight Construction Co*	1931 Austin Dr	Troy			X				X	X		N	L
108	Sunoco #0001-4738	1490 E Maple Rd	Troy							X	X		N	L
139	DDR Station*	510 W 14 Mile	Troy			X				X			N	L
141	JC Penney	700 W 14 Mile Rd	Troy							X-c	X		A	L
142	Baby World N Teens	512 W 14 Mile	Troy								X		A	L
152	Gould Inc Industrial Battery Div*	32305 Mally Rd	Madison Hts			X							A	L
155	Maschmeyer Concrete Co	32400 Mally Dr	Madison Hts							X-c	X		A	L
158	Henkel Surface Technologies	32100 Stephenson Hwy	Madison Hts			X					X		N	L
175	Valenite Div*	1100 W 13 Mile Rd	Madison Hts							X	X		A	L
176	Fuel Zone Inc	31015 Stephenson Hwy	Madison Hts							X	X		N	L
179	Biomagenic Resonance Inc*	30781 Stephenson Hwy	Madison Hts			X				X	X		N	L
181	Borden Dairy & Services*	30550 Stephenson Hwy	Detroit			X				X	X		N	L
188	Madison Hts Dept/Public Service	801 Ajax Dr	Madison Hts							X	X		N	L
193	S.E. Oakland Co RR Authority*	29470 John R Rd	Madison Hts			X			X			X	N	L
196	D-M-E Co*	29215 Stephenson Hwy	Madison Hts			X				X	X		N	L
201	Saturn Corp*	434 W 12 Mile Rd	Madison Hts			X				X	X		N	L
C14 (202)	Home Depot*	650 W 12 Mile Rd	Royal Oak			X							W	L
C8 (204)	Clark Store #2136*	601 W 12 Mile Rd	Madison Hts							X	X		W	M/H
C13 (212)	Sparks Tune-Up	1716 N Stephenson Hwy	Royal Oak							X			W	M/H
214	MDOT Bridge I-75 Under Gardenia	I-75 under Gardenia	Royal Oak			X							W	L
219	11 Mile & 75 Food Mart	2419 E 11 Mile Rd	Royal Oak							X-c	X		A	L
C6 (221)	Marathon Unit #1711 (Service Drive Auto)	402 S Stephenson Hwy	Royal Oak								X		W	M/H
230	KC Jones Plating Co	321 W 10 Mile Rd	Hazel Park			X	X						N	L
234	G and W Gas	24309 John R Rd	Hazel Park			X				X	X		N	L
235	United Unit #6199*	23990 John R Rd	Hazel Park			X				X	X		N	L
238	X Cel Industries*	505 W 9 Mile Rd	Hazel Park			X							A	L
240	Former John R Road Station 23201	23201 John R Rd	Hazel Park							X			N	L
250	City of Hazel Park	22600 N Chrysler Drive	Hazel Park			X					X		A	L
253	MDOT Bridge I-75 Under John R/Shell Service Station	I-75 under John R/22411 S Chry	Hazel Park			X				X-c	X		A	L
254	Advanced Friction Materials Co Plt 1	1435 Wanda	Ferndale			X		X					N	L
259	Color Coat Plating Co	21325 S Chrysler Dr	Hazel Park			X							A	L
262	Mr Jones Backyard	118 West George	Hazel Park		X								N	L
263	Jefferson Screw Products	1201 E 8 Mile Rd	Hazel Park							X			N	L
265	MDOT Bridge I-75 Under M-102 EBD Svc Rd	I-75 under M-102	Detroit			X							W	L

* - Indicates multiple site names and records are listed for this site.
[1] Proximity to Right-of-Way, W - Within ROW; A - Adjacent to ROW; N - Near ROW.
[2] Contamination Potential Rating, L - Low; M - Medium; H - high.
NPL - National Priority List (Superfund)
CERCLIS - Comprehensive Environmental Response, Compensation and Liability Information System; NFRAP-No further remedial action planned.
RCRIS - Resource Conservation and Recovery Information System; SQG-Small Quanity Generator; LQG-Large Quantity Generator; Corracts-Corrective Action Reports.
ERNS - Emergency Response Notification System
UST - Underground storage tank
LUST - Leaking underground storage tank; X-c - Closed case; X- Open case.

Table 4-18
Contamination Summary
(continued)

SID No.*	Site Name	Address or Location	City	Federal Records Databases				State Records Databases					Build Alternative	
				NPL	CERCLIS	RCRIS	ERNS	State Haz. Waste	State Landfill	LUST	UST	Inactive Solid Waste Facilities	ROW[1] (W/A/N)	Contamination Potential Rating
	Unmapped Sites													
O-1	MDOT Bridge I-75 over Square Lake Rd	I-75 over Square Lake Rd	Troy			X							W	L
O-2	MDOT Bridge I-75 over Adams Rd	I-75 over Adams Rd	Troy			X							W	L
O-3	MDOT Bridge I-75 under 14 Mile Rd	I-75 under 14 Mile Rd	Troy			X							W	L
O-4	MDOT Bridge I-75 over Red Run Drain	I-75 over Red Run Drain	Madison Hts			X							W	L
O-5	MDOT Bridge I-75 under 12 Mile Ped Walk	I-75 under 12 Mile Ped Walk	Madison Hts			X							W	L
O-6	MDOT Bridge I-75 under Shelvin U Turn	I-75 under Shelvin U Turn	Hazel Park			X							W	L
O-7	MDOT Bridge I-75 under Winchester	I-75 under Winchester	Detroit			X							W	L

* - These sites were not given a unique SID No. in the Environmental Atlas; The designations were assigned for identification purposes in this report.
[1] Proximity to Right-of-Way, W - Within ROW; A - Adjacent to ROW; N - Near ROW.
[2] Contamination Potential Rating, L - Low; M - Medium; H - high.
NPL - National Priority List (Superfund)
CERCLIS - Comprehensive Environmental Response, Compensation and Liability Information System; NFRAP-No further remedial action planned.
RCRIS - Resource Conservation and Recovery Information System; SQG-Small Quanity Generator; LQG-Large Quantity Generator; Corracts-Corrective Action Reports.
ERNS - Emergency Response Notification System
UST - Underground storage tank
LUST - Leaking underground storage tank; X-c - Closed case; X- Open case.

Source: The Corradino Group of Michigan, Inc.

4.16 Soils and Utilities

Mucky and peat soils are present in some locations in the north portion of the corridor. This could affect the cost of noise wall construction, but is not expected to affect roadway construction. Geotechnical studies have been performed to support project cost estimates.

A high-tension electrical line in the north section of the 12 Mile Road interchange would not be affected as the towers are not affected. Similarly, a cell tower at Square Lake Road and Adams road is close to I-75, but would not be affected. Other cell towers are similarly unaffected. There will be some effect on MDOT traffic monitoring equipment, some of which is located in the median. Effects on utilities will be consistent with normal utility relocation for roadway projects. Particularly, in the depressed section of the corridor utilities are carried across I-75 on the crossroad bridges.

4.17 Construction Permits

Permits will be required from the Road Commission for Oakland County to reconstruct bridges over or modify county roads. There will be permits necessary from the County Drain Office for each of the county drains that are crossed.

Michigan Department of Environmental Quality permits will be required during the construction phase for use of wetlands, stream crossings, and storm water discharges (Section 5.5).

4.18 Indirect and Cumulative Effects

The indirect (secondary) and cumulative effects associated with the proposed widening of I-75 are presented here. The basis upon which the analysis was conducted is defined in federal guidance, which indicates the following:

> Indirect (secondary) effects – Caused by the action (widening I-75) and occurring later in time or farther removed in distance, but occurring in the reasonably foreseeable future (40 CFR 1508.8(b)).
> Cumulative effects – Resulting from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions (40 CFR 1508.7).

The database supporting this analysis includes material from a number of sources, including the following:

- From SEMCOG:
  - ✓ "Detroit Wetlands and 300 years of Metropolitan Growth"
  - ✓ Future land use maps
  - ✓ "Land Use Change in Southeast Michigan, Causes and Consequences," March 2003
  - ✓ Sewer service areas
  - ✓ "Quality of Life Survey," 2002/2003
  - ✓ "Historical Population and Employment by Minor Civil Division," June 2002
  - ✓ "2030 Regional Development Forecast for Southeast Michigan"
- From the U.S. Census
  - ✓ Population data
  - ✓ Agricultural data

- MIRIS (Michigan Resource Inventory System) mapping
- Michigan Natural Features Inventory, maintained by MDNR
- I-75 Corridor Study in Oakland County (Feasibility Study), MDOT, November 2000
- County plat maps
- Aerial photography provided by the Oakland County Department of Planning
- Detroit Area Study, University of Michigan, 2001

It is recognized that this database is limited. In this situation, federal guidance is also helpful, i.e., "… the continuing challenge of cumulative effects analysis is the focus on important cumulative issues, recognizing that a better decision, rather than a perfect cumulative effect analysis, is the goal of NEPA" (National Environmental Policy Act).

To determine indirect effects an "area of influence" was established based on traffic/access. (Computer travel model runs were made to determine which roads in the region could experience changes in travel great enough to possibly require widening, if I-75 were widened.) For cumulative effects a broader area was covered where roadway improvements in the I-75 corridor were identified in the I-75 Feasibility Study. The land adjacent to I-75 is mostly "built out" in terms of the relative amount of development already in place.

Because of the extensive network of roads in Southeast Michigan, residents and businesses have large areas to choose from in deciding where to locate. But highway travel predominates, as the spread-out pattern and low density of housing make providing effective transit service difficult. So, in defining the assessment area in terms of time, the association of transportation and land use was examined using aerial photography since 1971, when the roadway network began expanding north, following the construction of I-75 in the 1960's. The aerial mapping allowed an assessment of the extent to which roadway improvements, as well as land developments, have occurred over the last 30+ years. The mapping then lead to the development of a series of issues by which indirect (secondary) and cumulative effects can be measured.

4.18.1 Indirect Impact Summary

The potential improvement of eight miles of arterials, whose widening would support shifts in travel demand resulting from the widening of I-75, are summarized below.

Traffic and Safety
Conditions at eleven high crash locations[12] will be improved.

Community Cohesion
No significant effects are expected, as the potential negative of road widening will be accompanied by improved or expanded sidewalks, and other traffic flow and safety upgrades.

Relocations
One residential, but no business relocations are expected.

Land Use
The indirect developments associated with widening I-75 must be consistent with local planning and zoning, and the transportation planning of the Road Commission for Oakland County, SEMCOG, and local jurisdictions.

[12] Compiled by the Traffic Improvement Association of Oakland County.

Environmental Justice
No disproportionate effect is expected.

Noise
Noise will likely increase slightly for some 250 residential properties along the local widened arterials, if the widened road becomes closer to homes. No hospitals or schools are expected to experience increased noise, but six churches could.

Air Quality
Smoother traffic flow is expected to allow air quality to be categorized moderate or good for those arterials to be widened as an indirect result of I-75 widening.

Parks
One park, at the southeast corner of Avon Road and Livernois Road could possibly be affected as an indirect consequence of widening I-75.

Cultural Resources
Historic Troy Corners and two archaeological sites will need to be reviewed for impacts as arterial widenings indirectly associated with I-75 widening go forward.

Farmland
No impacts to prime or unique farmland are expected.

Wetlands
Six-tenths of an acre of wetland near the Clinton River (Livernois Road) could require mitigation.

Water Quality
No significant effect on water quality is expected.

Threatened/Endangered Species
No significant effect is expected on threatened or endangered species.

Economy
Improving the eight miles of arterial roads indirectly associated with widening I-75 will have a neutral to positive effect on local economies. While property will be acquired for arterial construction, the improved access and safety will enhance the viability of the area, allowing the economy to continue to be sustained.

4.18.2 Cumulative Impact Summary

Widening of I-75 may be related to changes (possible widening) to 56+ miles of arterial roads in Oakland County as a cumulative effect over time. These cumulative effects, described below, are separate and distinct from the direct and indirect impacts.

Traffic and Safety
Conditions at 22 high crash locations will be improved.

Community Cohesion
No significant effects are expected, as the potential negative of road widening will be accompanied by improved or expanded sidewalks, and other traffic flow and safety upgrades.

Relocations
Twenty-seven residential properties could be subject to relocation, as well as twenty-eight businesses.

Land Use
The cumulative development associated with widening I-75 must be consistent with local planning and zoning, and the transportation planning of the Road Commission for Oakland County, SEMCOG, and local jurisdictions.

Environmental Justice
The potential widening of South University Road between Paddock and Martin Luther King Boulevard may involve an area with low-income and minority persons.

Noise
Widening 56+ miles of arterials could affect over 700 residential units, eight schools/hospitals, and 22 churches with increased noise.

Air Quality
Smoother traffic flow is expected along the local arterials to be widened, so air quality would fall in the moderate or good category as a cumulative effect of widening I-75.

Parks
The following parks would have to be reviewed for impacts as a result of the cumulative development associated with I-75's widening:

- Avon Nature Study Area
- Sullivan Park
- Amherst Park
- Waterford Oaks Park
- Troy Farm Park
- Donald J. Flynn Park
- Pinetrace Park

Cultural Resources
The following cultural resources may need to be reviewed for impacts:

- Five archaeological sites
- Historic Troy Corners
- Saterlee
- Samuel House
- Meadowbrook Farm

Farmland
No prime or unique farmland impacts are expected from the widening of 56+ miles of arterials.

Wetland
The widening of 56+ miles of arterials as a cumulative effect of widening I-75 could impact about eight acres of wetlands at the following locations:

- Square Lake Road at John R Road
- Clinton River near Avon and Livernois Roads
- South Boulevard at Adams

- Avon Road at Adams Road
- Maybee Road at Sashabaw
- Rouge River on Quarton Road
- South Boulevard west of Crooks Road

Water Quality
No significant effect is expected on water quality.

Threatened/Endanger Species
No significant effect is expected on threatened or endangered species.

Economy
Widening I-75 will have an effect on wealth distribution, but it is just one of many public policy decisions and market driven actions that are at work. Failure to widen I-75 is not a substitute for the need for fundamental changes, nor will it protect the wealth and quality of life of all commuters in Oakland County and Southeast Michigan. Such change is embodied in the recommendations Governor Grandholm's Michigan Land Use Leadership Council.

4.19 Energy

Energy will be used to construct the project. Fuel savings to motorists should be realized in the long term due to improved traffic flow. Stop and go traffic is very fuel inefficient. Increased capacity on I-75 will reduce congestion and the extent of stop and go traffic. Motorists will be able to maintain more constant traveling speeds on the freeway. The additional lane will allow greater ability to move around incidents. Travel on freeways is more fuel efficient than travel on arterial streets, which are controlled by traffic signals, causing all traffic to stop at some point.

4.20 Cost

Total project costs include: design and construction management, right-of-way, and construction. Construction costs are based on average unit bid prices and estimated quantities from the engineering analysis, and include a 15 percent contingency and 5 percent mobilization. Project design and construction management represent an add-on to the construction cost. The right-of-way/relocation cost is preliminary and is based on fair market value.

The base project cost in approximately 530 million (2003 dollars). At 12 Mile Road two options exist for interchange reconstruction. A SPUI would offer operational and safety benefits but cost $6 million more than a reconstruction of the existing interchange. The additional cost of developing an HOV lane would be about $6 million, about $3.5 million for signing and striping and other road work and $2.5 million for bridges and roadwork through the Square Lake interchange.

4.21 The Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

Environmental impacts would result during the construction of the proposed project. Reconstruction of bridges and service drives would temporarily affect the mobility of local residents, access to businesses, and emergency services. The impacts would continue through the

construction period, but local mobility and access would return and improve, upon project completion.

This project is a result of local, regional, and statewide comprehensive and transportation planning. Present and future traffic needs were considered and are reflected in the proposed project. It is concluded that the local short-term impacts and use of resources by the proposed action, if it were approved, are consistent with the maintenance and enhancement of long-term productivity for both the local area and the State of Michigan.

4.22 Irreversible and Irretrievable Commitments of Resources Which Would be Involved in the Proposed Action

Implementation of the proposed action involves the commitment of a range of natural, physical, human, and fiscal resources. Land used for reconstruction of I-75 is an irreversible commitment.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material will be expended for this project, if approved. Additionally, large amounts of labor and natural resources will be used in the fabrication and preparation of construction materials. However, these materials are not in short supply, and their use will not have an adverse effect upon continued availability of these resources.

Construction of this project will require a substantial one-time expenditure of state, federal, and local funds that are not retrievable. The commitment of these resources will result in an improved transportation system, providing improved accessibility and safety, and savings in time. These are anticipated to outweigh the commitment of these resources.

SECTION 5
MITIGATION OF IMPACTS

The goal of mitigation measures is to preserve, to the greatest extent possible, existing neighborhoods, land use, and natural resources, while improving transportation. Although some adverse impacts are unavoidable, the Michigan Department of Transportation (MDOT), through route location, design, environmental, and construction processes, takes precautions to protect as many social and environmental systems as possible. Construction activities that include the mitigation measures discussed below are those contained in the current MDOT "Standard Specifications for Construction."

Further agency coordination will continue through the design stage. Design plans will be reviewed by many MDOT personnel prior to contract letting in order to incorporate any additional social, economic, or environmental protection items. Construction sites will be reviewed to ensure that the mitigation measures proposed are carried out and to determine if additional protection is required. More mitigation measures may be developed if additional impacts are identified. Specific mitigation measures will be included in the design plans and permit applications.

5.1 Right-of-Way Acquisition and Relocation Impacts

A Conceptual Stage Relocation Plan has been prepared (Appendix A). The following standard procedures will be followed.

Compliance with State and Federal Laws – Relocation assistance and services will be provided by MDOT in accordance and compliance with Act 31, Michigan P.A. 1970; Act 227, Michigan P.A. 1972; and the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended, and Act 87, and Michigan P.A. 1980 as amended. MDOT will inform individuals and businesses of the impact, if any, of the project on their property. Every effort will be made, through relocation assistance, to lessen the impact when it occurs.

Residential – MDOT is required by statute to determine the availability of comparable, decent, safe and sanitary housing for eligible displaced individuals. MDOT has specific programs that will implement the statutory and constitutional requirements. Appropriate measures will be taken to ensure that all eligible displaced individuals are advised of the rights and benefits available and courses of action open to them.

Business – MDOT is required by statute to relocate eligible displaced businesses. MDOT has specific programs that will implement the statutory and constitutional requirements. Appropriate measures will be taken to ensure that all eligible displaced businesses are advised of the rights and benefits available and courses of action open to them.

Purchasing Property - The Michigan Department of Transportation will pay just compensation for fee purchase or easement use of property required for transportation purposes. "Just compensation" as defined by the courts is the payment of "fair market value" for the property rights acquired, plus allowable damages to any remaining property. "Fair market value" is defined as the highest price estimated, in terms of money, the property would bring if offered for sale on the open market, with a reasonable time allowed to find a buyer, buying with the knowledge of all the uses to which it is adapted, and for which it is capable of being used.